

Canada and Bull Thistle commonly invade disturbed ground, including roadsides, pastures, riparian areas, beach meadows, and sand dunes. New infestations are often found on the edge of wet sites including streambanks, lakeshores, muskegs, and ditches. Although they grow along the edges of forests, they do not fare well under dense tree cover.

Guidelines for Control

Due to its vigorous underground growth habit, ability to store energy in its roots, and thick coating of dense hairs, which can protect plants from herbicide application, Canada thistle is notoriously difficult to eradicate (see Figure 4). When newly established plants are found in an area every reasonable effort should be made to eradicate them quickly. In Alaska today, we have relatively few locations infested with Canada or bull thistle. By treating these few sites now, we can keep these species from becoming permanently established along our rivers, streams, and roadways. Whatever the treatment method used, repeated effort and monitoring for several years are required to eliminate these plants from a site. Often a short-term decline may be seen, followed by a complete recovery by the plant. Entire colonies should be treated, as they may not be physically connected underground. Treating just a few plants in a colony may leave the others to take over. Any treatment method should include a plan to reestablish native vegetation or desirable plants in its place. Eradication methods for Canada thistle should focus on killing the entire colony instead of prevention

of seed production since its primary means of spread is through vegetative propagation. Typical control methods include introduction of insects or diseases that attack the plant (biocontrol), grazing, hand removal, mulching, mowing, tillage, and herbicides. Although utilized in other regions of North America, biocontrol agents have not been introduced to Alaska. Sheep and goats may eat young seedlings but will not eat established plants. Hand removal is usually impractical for Canada thistles due to the difficulty of removing the entire root system, but may work for very small colonies if care is taken to dig up all roots and rhizomes. Bull thistles are easier to control by hand pulling than Canada thistles. Because each plant has a single taproot, the entire plant may be pulled up easily. Mulching is ineffective unless spread 6 feet deep over an area 30–40 feet in diameter. If it is necessary to pull thistles after seed set, cover the plant with a bag to contain the wind-blown seeds before pulling. Mulching can suppress the growth of competing plants and favors the growth of thistles. Mowing will not kill thistles unless repeated at 1-month intervals for a period of 4 years or more. Tillage will often break up Canada thistle colonies into smaller pieces, which may recover and increase infestation density and spread. However, mowing and tillage may be used to encourage the plants to assume a growth stage better suited for control by herbicides. Covering with a barrier such as black plastic can be effective if the plastic is left in place for a period of 2 years. Make sure the plastic spreads several yards beyond the

infested area to keep shoots from sprouting around the edge. Herbicides such as glyphosate are the best choice for killing Canada thistle. Glyphosate is absorbed through foliage and translocated through the entire plant, roots and all. Glyphosate should always be applied to plants that are in a vigorous state of growth. Glyphosate is a nonselective herbicide, which will kill all plants, so care should be taken to avoid damage to desirable vegetation. Herbicides may be applied by spraying or by direct application with a wick or brush to minimize off-target effects. Effects may take two weeks to become noticeable, longer under cool or cloudy conditions. Proper timing and dosage are a must; otherwise the plants recover, sometimes in better shape than before because competing vegetation was killed. Mature thistle plants will not absorb herbicides well enough to get a complete kill. But if the plants have been forced into the rosette stage by a mid- to late-summer mowing they will readily absorb the herbicide if sufficient time is allowed for the plants to resume growth as rosettes, but before stem elongation. **For best results, mow plants in mid-summer, then apply glyphosate to regrowing plants in the early fall.** Allow at least four weeks for initiation of active growth and rosette development. Apply before a killing frost. Herbicide will then be transported along with the photosynthetic products from the leaves to the roots. Selective herbicides such as clopyralid, 2,4-D, and metsulfuron methyl are also recommended for use on thistles by

land managers experienced in the use of agricultural pesticides. These are selective for broadleaf weeds allowing competing grasses to quickly move in, but require more care in their handling for health and environmental reasons.

Caution: Herbicides can be dangerous to the user and the environment unless used according to the label directions. Federal law requires that the user read, understand, and follow all label directions. Consult with a UAF Cooperative Extension Service office near you for more information on use of herbicides. Mention of a herbicide in this publication does not constitute a recommendation for use by the USDA, nor does it imply registration of a product under Federal Insecticide, Fungicide, and Rodenticide Act, as amended. Mention of a proprietary product does not constitute an endorsement by the USDA.

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Invasive Thistles
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Cover photo: Canada thistle plant found along Lynn Canal.



Thistle is an old English name for a large group of plants with an unpleasant reputation. In ancient history the thistle represented part of a primeval curse placed on the earth, and on humans in particular.

Thistles in agriculture have a reputation as a sign of neglect. However, this unfortunate characteristic is only true of a few invasive species and is not accurate for the vast majority of native thistles, which have many useful traits. Europeans, Native Americans, and early settlers found many thistle species to be edible as well as useful for medicinal purposes. Thistle seeds, though bitter when eaten raw, are much more palatable when roasted. Young leaves of Canada and bull thistle (with the spines removed) can be served as a salad or cooked like spinach.

Canada thistle (*Cirsium arvense*) is an invasive plant found throughout much of the United States and Canada. Its common name is deceptive, as it is native to Europe and was introduced to North America in the early 1600s. Farmers have long recognized it as an aggressive weed, even in its native range. The State of Vermont legally listed Canada thistle as a noxious weed in 1795. Canada thistle is listed as a noxious weed in at least 35 states and much of Canada, and is on Alaska’s prohibited noxious weed list. Bull thistle (*Cirsium vulgare*) is also a weedy native of Europe, which has now invaded all 50 states.

Canada thistle was first collected in Alaska in 1946 in Palmer (University of Alaska, Fairbanks Herbarium). Discoveries of thistles have increased dramatically in the 1990s. One example of a proactive eradication effort

occurred in Delta. The plant was first found in the Delta Junction area in 1982. Due to the aggressive action of local residents, none has been seen since 1987, leaving a sense of cautious optimism that the plant has been eradicated from the area. Unfortunately, Canada thistle is still spreading in Fairbanks and south-central Alaska. Canada thistle has recently arrived in southeast Alaska; “hitchhiking” as seed in the rootballs of ornamental trees and shrubs or in hay bales used for erosion control on construction sites.

Bull thistle has been found at a number of locations around Alaska, including Fairbanks, Anchorage, Ketchikan, and Haines. It is especially abundant on Prince of Wales Island along roadsides.

Description

Canada thistle is identified by its prickly stems and leaves, and purple-pink flowers about one inch in diameter (Figure 1). Leaves are oblong, 2–6 inches long, alternate on the stem, and arise directly from the stem without a distinct leaf stalk. Leaves have a curled wavy



Figure 1: Male flower heads (left) and female flower heads (right) of Canada thistle are borne on separate plants.



Figure 2. Bull thistle flower head.

form, with prickly-toothed irregularly lobed edges, and are smooth above and smooth to hairy on the underside. The plants grow to 5 feet tall with ridged, branching stems.

Bull thistle has thicker, more robust stems, up to five feet in height, with many spreading branches. It has larger flower heads than Canada thistle, with leaf surfaces prickly-hairy above and cottony below (Figure 2). Leaf bases have irregular spiny “wings” that clasp the stem.

Only one species of thistle, the edible thistle (*Cirsium edule*) is native to Alaska. It is restricted to the furthest southern reaches of southeast Alaska. This species is rare, so if you find a thistle in an undisturbed alpine meadow in this small area of the state, don’t disturb it, but report it to Forest Service botanists.

Life History

Canada thistle, a long-lived perennial, reproduces by seed and vegetatively by extensive horizontal roots. A single plant can produce up to 5,000 seeds per year, but the growth of rhizomes and underground root fragments is the principal means of spread. Its massive underground network of roots can expand more than 20 feet in one year, forming large patches with many plants connected to the same root system. Underground stems can produce 2–3 new buds per foot of growth, each bud growing into new aboveground stems. The resulting densely packed colonies spread out over time, growing up to 100 feet in diameter. Root fragments as small as 0.5 inches can develop into new plants.

Canada thistle favors deep, well-aerated soils with moderate moisture availability, but can grow in a wide variety of conditions. The seeds require some soil disturbance, such as tillage, excavation, or moose activity, to



Figure 3. Bull thistles appear as a basal rosette in the first year of their biennial life cycle.



Figure 4. Canada thistles can form dense colonies that are difficult to eradicate.

gain a foothold in new territory. New shoots emerge in spring when temperatures average above 40° F. Growth is fastest when daytime temperatures reach the high seventies. The plants grow as clumps of leaves (rosettes) close to the ground until day length exceeds 15 hours, then the stems “bolt,” elongating and producing flowers. If mowed late in the summer, the plant resumes growth as a rosette until a killing frost, after which it overwinters underground resuming growth the next spring.

Bull thistle is a biennial (taking two years to complete its life cycle). Reproducing by seed only, a mature bull thistle plant can produce up to 4,000 seeds per year. In the first year, Bull thistle appears as a rosette of closely spaced leaves (see Figure 3). In the second year, a many-branched stem grows and elongates, bearing a handful of large, distinctively urn shaped, purplish

flower heads. Later in the season, the flower heads develop into a mass of cottony tan “parachutes” that carry the seed in the wind. While Canada thistles produce an ever-expanding network of rhizomes underground, bull thistles arise from a stout taproot.

Like Canada thistle, bull thistle will also revert to a rosette when mowed. Therefore, mowing or cutting of bull thistle may extend its life span beyond the normal two years, until the plant can successfully produce seed. Seed of both thistle species can be carried great distances on the wind, and these seeds can remain viable in the soil for up to 21 years.

Impacts

As Canada thistle colonies grow, they displace desirable native vegetation, degrade wildlife habitat and recreation sites, and compete with crops and pasture. Thistles are problematic in rural areas because the dense, prickly spines can irritate and infect skin of livestock animals. In general, the sharp spines of Canada and bull thistles deter livestock and wildlife from grazing. Horses and cattle may ingest the seeds of thistles and deposit them later with an added dose of fertilizer. In extreme cases, thistle may take over an entire pasture. To avoid introducing thistle and other weeds, livestock owners, dog musher’s, and gardeners should use only certified weed-free hay and straw. Seeds also move in soil stuck to vehicles, farm machinery, and excavation equipment. Be sure to wash equipment thoroughly before moving from a weed-contaminated site.